altering the positions of the cleats, so can the angle be made more obtuse or acute; and the more acute it becomes the more is the drag from the head and the less from the arms: as much should be taken from the head as the patient can possibly bear. Sayre's method allows no variation, or very little, between the arms and head. The head-band is made of worsted webbing; its form and mode of wearing is shown; it cannot slip back on the trachea, and adapts itself to all shapes of heads. By wearing the sliders carrying the rings more forward or backward, the drag on the chin or occiput is altered. A wooden tripod taking into three lengths is more convenient for private work, than the heavy iron one first introduced.

When a case of general curvature is suspended, the immediate result is astonishing: down drops the elevated shoulder; the rotation of the spine untwists, and the curves, both primary and secondary, disappear. In early cases, all this may be witnessed; in more established deformity, the relief is only gradual. To whatever degree extended, the jacket of plaster there retains the spine, not by pressure on this point or on that, but, by its rigidity, preventing the trunk from telescoping to its previously deformed position.

It is not unusual to see a patient with general curvature more than an inch taller when the jacket has set; but do not be too sanguine; at the end of, say, two months, when removed, the patient will sink in height, but not to the same degree as before: a little—I have known three-fourths of an inch in that time—will be permanently gained, and so with each jacket you will more and more benefit your case.

Where the case is slight—what the public call "outgrowing shoulder"—though the jacket should, if allowed, be put on, yet with the swing alone night and morning you may cure your case in two or three months. When swinging a case to put on the jacket, you must use both head and arm-bands, though, if the patient can suspend himself by his head alone, all the better; I have never yet, however, found the case that could so do for the six minutes required for applying the plaster bandages. But, when a case of lateral curvature is exercising (which should be done whether wearing the jacket or not), only use the head-band on the small crossbar in the way Sayre figures in his book; the patient can elevate himself from the ground without risk if his hands do not get below his chin. This should be done up and down every morning and evening for five minutes. In caries, even some increase in height is usually at once observable; but I do not lay stress upon this; for, whatever permanent reduction of the deformity there eventually may be, it will be the result of gradual rather than of immediate straining.

I know of only two circumstances that would prevent my advising the use of the jacket: one where there are no symptoms whatever beyond the deformity, which has remained the same for long; the patient is already well—a cripple; the other where the patient is in the very last stage of the disease. Abscesses do not prevent the treatment; they benefit by it; for the pus now gravitates from the seat of disease, and so, if the abscess be already open, it tends the sooner to close; or, if not open, it will, in all probability, gradually disappear. One of my cases illustrates this last point very well indeed.

Sore backs and chafes from the jacket are the fault of the putting up; cotton-wool padding should quite obviate such unpleasantness. Very seldom, out of more than seventy jackets, have I seen the skin become really irritable. It is an awkward circumstance, and must be met by removal for a time of the jacket. Usually after the first day or two, the jacket becomes as unnoticed by the patient as any other article of dress; its porosity allows the perspiration to transude.

Where the disease is above the level of the armpits, and so beyond the immediate influence of the jacket—i.e., upper dorsal or cervical regions—what do you do? In the latter case, undoubtedly employ the jurymast, which you see this patient wearing; in the former, the jurymast is best employed, yet you do good by the jacket only. I had seen cases improve at once where the boss was just appearing above the jacket, and so beyond (apparently) its influence. This is why. In such cases, though you lose extension on the disease, you give it rest; for the ribs that descend from the seat of disease are raised in the swing and held firmly by the jacket, and thus keep the spine sufficiently fixed.

Upwards of forty cases have passed through my hands, and I am deeply impressed with the utility of this treatment by extension. If not cured, you may be sure your patient will not get worse; but, from what I have seen, I believe that even cases which no longer can get comfort from spinal supports may be actually improved by the extension and jacket. The benefit to, or cure of, the patient may now fairly, in point of time, be reckoned by as many months as it formerly took years to do what little good the orthopedic plan was capable of accomplishing.

When you have reached the limit of improvement in any case, espe-

cially of general curvature, you should give the patient a well fitting corset, to prevent a relapse: the last plaster jacket may be cut up and laced on again; or one of felt or leather, moulded like it, may be employed. It should be laced on while the patient is in the swing or lying on the ground, and should not be removed more than once in three days. But I warn you against thinking you can improve your patient from the first by using a felt or any other vest that will lace up, in lieu of the plaster jacket. It is the integrity of the latter that constitutes its perfection; and, once cut up, it becomes little better than the old spinal supports, able to prevent relapse, but not to cure.

Each fact I have now laid before you I can verify in the cases that have happened to come before me. I urge you to study while here this plan of treatment; it will be soon recognised as the only reliable one, and it should be to you—the profession generally—and not to special practitioners or instrument-makers, that the public should look for assistance. There is nothing "special" in it; but once allow it to become wrapped in the mysteries of specialism, add "improvements", dock it of its simplicity, and you will find lost to yourselves an immense field for doing good, and of giving relief, not only to the rich, but to the poor, who alone can appreciate the terrors of spinal disease.

SUMMER MOUNTAIN STATIONS IN SWITZERLAND: THE LAKE LUCERNE DISTRICT.

By J. HENRY BENNET, M.D.

II.

THE Lake of Lucerne is not by any means so large a sheet of water as the Lake of Geneva. It is 204 feet higher—1,434 feet, against 1,230; is surrounded by high snow and glacier-capped mountains on both sides, and is further north. In its southern portion (Uri), it has more the appearance of a wide river incased between high massive mountains, than of a lake. Consequently, the entire lake-region is said to have a cooler climate in spring than that of the Lake of Geneva, which I have found to be the case. Twenty-four hours' rain (July 3rd) covered the upper regions of Mount Pilate, of the Rhigi, and of all the other high mountains that surround the lake, with snow to a degree that I never saw exemplified during the last fortnight of June, in rainy weather, on the Lake of Geneva.

There are various mountain summer-stations on the lake and in its neighbourhood, the more important of which I visited, remaining at the comfortable—indeed luxurious—Schweitzerhoff Hotel at Lucerne as a centre. The snow which fell on the mountains on the 3rd melted on the 4th; and from that time to the 15th, when I left, the weather was cool and pleasant; night about 58 deg.; day about 70 deg. We had only one day's rain.

The health-stations I examined were Axenfels and Axenstein, Burgenstock, Sonnenberg, Engelberg, and the Rhigi hotels. Any one of them can be easily visited from Lucerne between a nine-o'clock breakfast and a seven-o'clock dinner. The plan is to take the ten-o'clock steamer to the foot of the road that leads to the sanitarium, there to hire a carriage and to lunch at the hotel, descending in time for the boat.

The Kurhaus Axenstein is a commodious elegant hotel, with extensive, well-timbered, shady grounds; the principal trees being the beech and spruce-fir. It is 2,300 feet high, about 1,000 feet above the lake near Brunnen, two hours from Lucerne by steamer. The view from the house and grounds is magnificent. It is sheltered from the north-east, and enveloped in sunshine all day. It is, no doubt, an admirable mountain resort for June, but probably too warm in July and August for those who want bracing. Axenfels is a large hotel one hundred feet lower down, in precisely the same position, but without the shady groves and grounds of Axenstein, and consequently rather less expensive. The season here begins as early as the 15th of May.

The Burgenstock Hotel is situated on a promontory, or a projection, of the Burgenstock Mountain (3,721), which advances into the lake on its south side opposite the Rhigi, and nearly in front of Lucerne. The hotel is 2,700 feet above the sea; 1,200 feet above the lake. The situation is admirable, on a saddle-back ridge which runs along the lake, with splendid views on all sides; that in front, overlooking the Rhigi and the lakes to the north-east of Lucerne, is entrancing. The hotel is an admirable one, kept like a first-class English house, not too large, not frequented by or prepared for passing travellers, and not assuming to be cheap. The beautiful walks are kept like the grounds of an English gentleman. Being several hundred feet higher

than Axenstein, and directed north-east, it must be cooler than either Axenstein or Axenfels, and is suited for a residence when these hotels become too warm. The season is said to begin the 1st or 15th of June. I was so much pleased with this house, that I mentally resolved to make it my head-quarters if ever I spend the month of June on the Lake of Lucerne. It is but little known to the English, and is principally frequented by first-class Germans. The station is Stanysad, on the right arm of the lake, fifty minutes from Lucerne.

The Kurhaus Sonnerberg, at Seelisberg (2,772 feet), is just opposite Brunnen and Axenstein, nearly five hundred feet higher, and directed due north, with a higher shading mountain to the north. Consequently, it is much cooler, as I myself perceived, for I descended from one and ascended to the other the same day. It is also about two hours by steamer from Lucerne, the road winding up through pastures and beech and pine forests from the landing-place, Trolle, where carriages are always waiting. The Sonnenberg Hotel is a little town, with three hundred beds, large reception and dining-rooms, music three times a day, and a village of accessories and outlying works. It is full of life, bustle, and animation, which suits many even in a mountain sanitarium. I presume that, in a climatic sense, it is pretty much in the same condition as Burgenstock, except that it is sheltered on the south-west side by high mountains (Seelisberg, 6,316 feet), and is not, consequently, so much exposed to wind.

Engelberg (3,314 feet) is at the head of a valley—that of Engelberger Aa—which opens out at Stanz, whence starts also the road to Burgenstock, and is thirteen miles from Stanz. For the first nine miles, the rise is all but imperceptible, and the valley wide and fertile. The last six miles are through a romantic beech and fir-clad Alpine gorge, which opens out into the Engelberg valley proper, an amphitheatre of grass and fir-forest, backed by the Titlis mountain (10,515 feet). The glaciers of the latter descend into the amphitheatre, and are within an hour or two's walk of the Sonnenberg hotel. This hotel is a large, commodious, well appointed, well kept, and reasonable house, with above two hundred beds. Being 3,314 feet high and in proximity to the extensive glaciers of the Titlis, the climate is cooler than that of the stations on the lake already described. I was told that the nights are always cool and pleasant; but still the midday heat must be considerable even at this elevation in hot weather in July and August. I have always found it so at this height in Switzerland. At Grindelwald, where I am now writing, at an elevation of 3,418 feet, the thermometer is at midday 76 deg. in my shaded room, with glaciers all round in front of my windows, within a rise of 200 feet; whilst out-of-doors it is insufferably hot even on the glaciers, I am told by the tourists, and at 6,000 feet and more of elevation. I was once here before, thirty years ago, in August; and I recollect the thermometer at 84 deg. at the foot of the glacier. Engelberg, however, is a charming station, surrounded with easy mountain excursions, in a lovely valley, and is a well-known favourite resort. It is accessible early in June, and could be accepted as a residence until it becomes too hot. Indeed, according to its enthusiastic *habitues*—whose statements, however, can only be accepted with a certain amount of reserve—it is pleasant all summer.

Lastly, there are the Rhigi hotels, situated on this celebrated mountain, which every traveller who goes to Switzerland ascends by its curious railway. At the summit—Rhigi Kulm (5,906 feet, or 4,472 feet above the Lake of Lucerne)—there are now two splendid hotels, at which, however, no one ever stays; they are too bleak and exposed. They fill every afternoon with several hundred travellers, who sleep, see the sun rise, and depart after breakfast. At a lower elevation are several large commodious hotels—Kaltbad (4,728 feet), Rhigi Forst (4,747 feet), Rhigi Schleideck (5,407 feet)—which are residential and much frequented. They are exposed; vegetation is very bleak all around them, the trees being limited to a few small firs, growing sparsely and in groups, although I am told that the Alpine flora is rich. However, they offer a most valuable resource in case of extreme heat in any of the other sanatoria on the Lake of Lucerne and its vicinity. In the course of a few hours, even a great invalid can easily be transferred to the higher regions.

In speaking of these sanatoria, I have only mentioned the first-class hotels; but I must add that at all, with the exception of the Burgenstock, there is in the vicinity a group of minor hotels or pensions of a very reasonable character. In these, the pension or boarding terms, for a week at least, are from 5 to 8 francs (4s. 6d. to 6s. 6d.) a day. The expense of the large first-class hotels is from 10 to 15 francs—that is, from 8 to 12 shillings—a day; and several refuse boarders, keeping to hotel prices. There is all the difference in these establishments that there is in England between inns and hotels, where the expense is 4s. or 12s. a day. The Lake of Lucerne, as that of Geneva, is surrounded by cheap pensions, always clean and comfortable, although humble and

rustic. I am now examining the sanatoria of the Interlaken district, of which I shall give an account in a third and concluding paper.

I would again remark that any of my overworked fellow-practitioners who would like to combine pleasure and profit might take this account of the Lucerne sanatoria as their guide, reach Lucerne from London easily in three days, and examine for themselves all the places I have named, spending their holiday between them very pleasantly. Every one of these localities is surrounded by Alpine walks and excursions, which constitute the principal pleasure of residence to those who are well enough and strong enough to undertake them. Either the Geneva Lake district or the Lucerne is quite enough for one visit. I feel that I shall have to return to both for pleasure; that this journey is in a great measure one of study, one of business, and consequently much too hurried. I have to tear myself from the loveliest places, where I fain would linger and explore for my own satisfaction and delight.

REPORT OF A CASE OF MALIGNANT CHOLERA, IN WHICH THIRTY-TWO GRAINS OF CHLORAL- HYDRATE WERE HYPODERMICALLY INJECTED: RECOVERY.

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M. M., the wife of a soldier, a very spare woman, aged 30, the mother of four children, was carried to the Female Hospital, Fortress Gwalior, about three o'clock in the afternoon of October 27th, 1877, suffering from cholera. From a statement subsequently made by herself, it appears that on that same morning she was feeling well till after breakfast. About 11 o'clock she felt uncomfortable and oppressed, and laid herself on her bed. She went to sleep, and, about 1 o'clock, woke up, and found that copious watery evacuations were literally flowing from her, and saturating her bedding. Vomiting and cramp soon set in, and her husband then sent for a *dooly*, and had her conveyed to the hospital. On admission, she had the usual symptoms of well-marked collapse. The skin was cold, lips blue, eyes sunk, tongue and breath cold, finger-ends shrivelled, voice sepulchral; the pulse could not be felt at the wrist, nor even in the brachial artery. As she was a very thin woman, it could have been easily felt there if it had been present. There were cramps in the hands and feet, and a good deal of vomiting, but not very much purging. The temperature in the axilla was 95.2 degs. Fahr. On examining the thorax by percussion, it was found that the usual area of cardiac dulness emitted a resonant sound. On application of the stethoscope, the beating of the heart could be scarcely heard, and at times seemed lost; but respiration was detected over the part of the chest where the heart-sounds are usually perceptible.

Shortly after admission, one scruple of chloral-hydrate, dissolved in three ounces of water, was given by the mouth, but was rejected; it was therefore determined to administer that drug subcutaneously at once. At 4 o'clock P.M., six grains of chloral, dissolved in sixty minims of water, were injected into the substance of the left deltoid muscle in the following manner. As the hypodermic syringe employed held only twenty minims, containing two grains of chloral, the point of the cannula was passed through the skin and into the muscle perpendicularly for about the depth of one inch; the syringe was then emptied, and the cannula was withdrawn until its point reached the areolar tissue, but was not withdrawn through the skin. It was then thrust in a slanting direction at about an angle of forty-five degrees into another portion of the muscle. The cylinder of the syringe was then unscrewed, filled with twenty minims of the solution, screwed on to the cannula, and again emptied. The point was then plunged into the muscle in an opposite direction, and twenty more minims injected. By these means, sixty drops of the solution were injected into three different portions of the muscle with only one puncture through the skin, thus lessening the chance of irritation of the cutaneous nerves. These details are given thus minutely, as a strict attention to them is considered a very essential part of the method of treatment recommended.

Observations were taken with the clinical thermometer in the axilla every twenty minutes. Half an hour after the first operation, sixty more minims of the solution were put into the deltoid muscle of the right arm in the manner described above. The temperature in the axilla now began to rise steadily.—By 6 o'clock, eighteen grains of chloral in 180 minims of water had been injected through three cutaneous punctures, and the thermometer registered 97.8 degs. Fahr. The cramps had ceased by this time, and the vomiting was much less. Some serous evacuations had been passed.—At 7 o'clock, she passed a